

Work Order ID 85054

85054

Page 1

May-31-12 3:42:17 PM

Item ID: D212-664-101

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube Fwd

Start Date: 31/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 14/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: *MLJ*

Date: *12/06/01*

Tooling:

Date:

Run Start *NR1*

QC:

Date:

SPC (Y/N):

Date:

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D212-664-141

Rev D (DEO)

100

0.00

100

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-101 CHG005

110

Pick Kit

0.00

110

Packaging

Packaging

Memo

0.00

Packaging

120

0.00

120

BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio D212-664-101

MLJ 12/06/12

MO 12-6-8

Joe 12-6-8

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

130

QC

Memo

0.00

Quality Control

140

Crosstubes

0.00

140

Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549, using drill table DT8577, set-up towers in hole #7 as per QSI 10

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

12-06-11

1110

12-6-11

W/O:		WORK ORDER CHANGES					
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Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

Crosstubes Chemical Conversion

0.00

150

HandFXtube

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

Pto

160

QC5- Inspect part completeness to step on W/O

0.00

160

QC

Memo

0.00

Quality Control

Srdalr

170

Outsource process - NDT per QSI038 4.1

0.00

170

Outsource2

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038

Issue P/O:

LPI as per ASTM 1417 Level 2

Attach copy of NDT results to work order

85054 17/87

M 12-06-12

W/O: 85054 Perm. change		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
		Step # 150 to be moved after step # 190 - ADD ADD Qc7 inspect: Due to contamination issues	B	12.06.21		W 12.06.21	S 12.06.21	

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Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

Receive & Inspect for Damage & Mat'l Certs
Packaging

0.00

180

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

IX 

SP 12-6-12

190

QC5- Inspect part completeness to step on W/O

0.00

190

QC

Memo

0.00

Quality Control

Inspect for damage & ensure results are as per Dwg D212-664-141

1  12-6-12

191 - chemical coat as per order

192 - QC7 M 12-06-13 (1)

AB 12-6-12

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Date:

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Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

200

Spray Painting per QSI005 4.2
SprayPaint

0.00

200

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-141 with White Imron as per QSI 005 4.2

PRIME: 121746

Start Time: 6:00

Finish Time: 7:00 > AS 12-6-16

PAINT: 120985

Start Time: 3:30

Finish Time: 4:30 > AS 12-6-16

clear: 121625

start: 10:00

Finish: 11:00 > AS 12-6-17

210

QC14- Inspect Spray Paint

0.00

210

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

AS 12 - 6 - 17

W 12 06 12

W/O:		WORK ORDER CHANGES					
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Start Date: 31/05/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 14/06/2012 Req'd Qty: 1.00 ***1***

Customer:

Reference:

Approvals: Process Plan: Date: Tooling: Date:

Run Start ***NR1***

QC: Date: SPC (Y/N): Date:

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

220

220

Crosstubes

Crosstubes

Crosstubes

Memo

1-Abrade mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015

A/R Proseal 890 Batch: 121287

3- Torque bolts as per dwg

12 - 6 - 18

230

230

QC

Quality Control

QC6- Inspect dimensions to drawing

Memo

12 06 19

240

240

Packaging

Packaging

Pick Kit

Memo

12-6-19

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Start Date: 31/05/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 14/06/2012 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

250

QC4- 100% Inspect kits for completeness

0.00

250

QC

Memo

0.00

Quality Control

260

Packaging

0.00

260

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-101

270

QC21- Final Inspection - Work Order Release

0.00

270

QC

Memo

0.00

Quality Control

Handwritten signature

W/O:		WORK ORDER CHANGES					
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Page 1

85054

D212-664-101

Required Date: 14/06/2012

Required Qty: 1.00

IPP Rev:E04.02.16ReformatKJ/DS

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM

IPP Rev:G 07-04-30 As per Rev C JLM IPP Rev:H

11.04.26 inspection strip ecn 11-549 EC verified by:DD

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664-101TRN		Manufactured	No			110	Each	0.0000	1	1			
D212-664-101TRN													
Crosstube Turning Detail													
D3595-063-450		Manufactured	No			230	Each	179.8095	4	4.210526			
D3595-063-450													
RUBBER CUSHION													

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	60	
82511	60	4
LG051	109.7	
80161	1.7	
84715	108	
MAT052	10.109474	
67353	2	
68893	6	
70113	0.56	
71354	0.2	
74113	0.349474	
75597	1	

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Picklist Print

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Work Order ID: 85054

Parent Item: D212-664-101

Parent Item Name: Crosstube Fwd

85054

D212-664-101

Start Date: 31/05/2012

Required Date: 14/06/2012

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

220

Each

123.0000

4

4

**

MS21920-25

Clamp(per MIL-DTL-8783C)

AP 12-6-18

Location

Loc Qty

Loc Code

LG050

75

116264

2

117998

4

118142

4

119339

2

119746

2

120475

7

120920

54

LG051

48

121583

48

D2893-1

Manufactured

No

220

Each

40.0000

2

2

**

D2893-1

2.75 Support

AP 12-6-18

Location

Loc Qty

Loc Code

LG

16

83056

16

LG052

24

72865

2

80271

20

82228

2

D3428-1

Manufactured

No

240

Each

33.0000

1

1

**

D3428-1

Placard

SP 12-6-19

Location

Loc Qty

Loc Code

ST042

33

78933

6

81881

17

83582

10

May-31-12 3:42:22 PM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
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Parent Item Name: Crosstube Fwd

85054

D212-664-101

Start Date: 31/05/2012

Required Date: 14/06/2012

Start Qty: 1.00

Required Qty: 1.00

AN6-35A

Purchased

No

240

Each

74.0000

4

4

**

AN6-35A

BOLT

Location

Loc Qty

Loc Code

342

50

121181

50

ST342

24

120187

24

AN6-36A

Purchased

No

240

Each

84.0000

4

4

**

AN6-36A

Bolt

Location

Loc Qty

Loc Code

ST342

84

118422

2

119449

1

120187

8

120423

73

MS21042L6

Purchased

No

240

Each

648.0000

6

4

**

MS21042L6

Nut

Location

Loc Qty

Loc Code

ST300

648

117677

25

118384

3

118927

48

119075

372

120308

200

AN960JD616

NAS1149D0663J

Purchased

No

240

Each

0.0000

18

18

**

AN960JD616

Washer

May-31-12 3:42:22 PM

Shop Packet Print

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Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.514±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF
USING VIBRATING STYLUS
- WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 85054 MLJ

12/06/01

REMOVED FROM UNDER REVIEW PER
UNDER REVIEW EGN # 11-614
11/15/01
FOR PRE-SEALING SAFETY

DEO ATTACHED

RELEASED
2009-10-29
M

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-141	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR REPRODUCED IN ANY FORM OR BY ANY MEANS WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
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8 7 6 5 4 3 2 1

12 13 15
D2893-1 SUPPORT
MS21920-25 CLAMP, 2X
D3595-063-450 RUBBER CUSHION, 2X
2 PL

A4-2
A

14.00 (-141)
OR 13.75 (-141B) D

ES054

D212-664-501
BENT TUBE

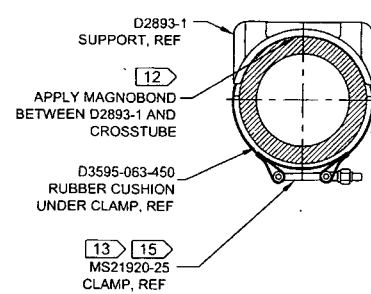
SYM

D212-664-141/-141B
ASSEMBLY DETAIL D

ECN# 11-614
1.07.20
UNDER REVIEW
11.13

DEO ATTACHED

RELEASED
2009-10-29
1/10



SECTION A-A D5-2
SCALE 4X

DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	11	D212-664-141	SHEET 2 OF 4
APPROVED	11	TITLE	SCALE
DE APPR.	11	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

8 7 6 5 4 3 2 1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

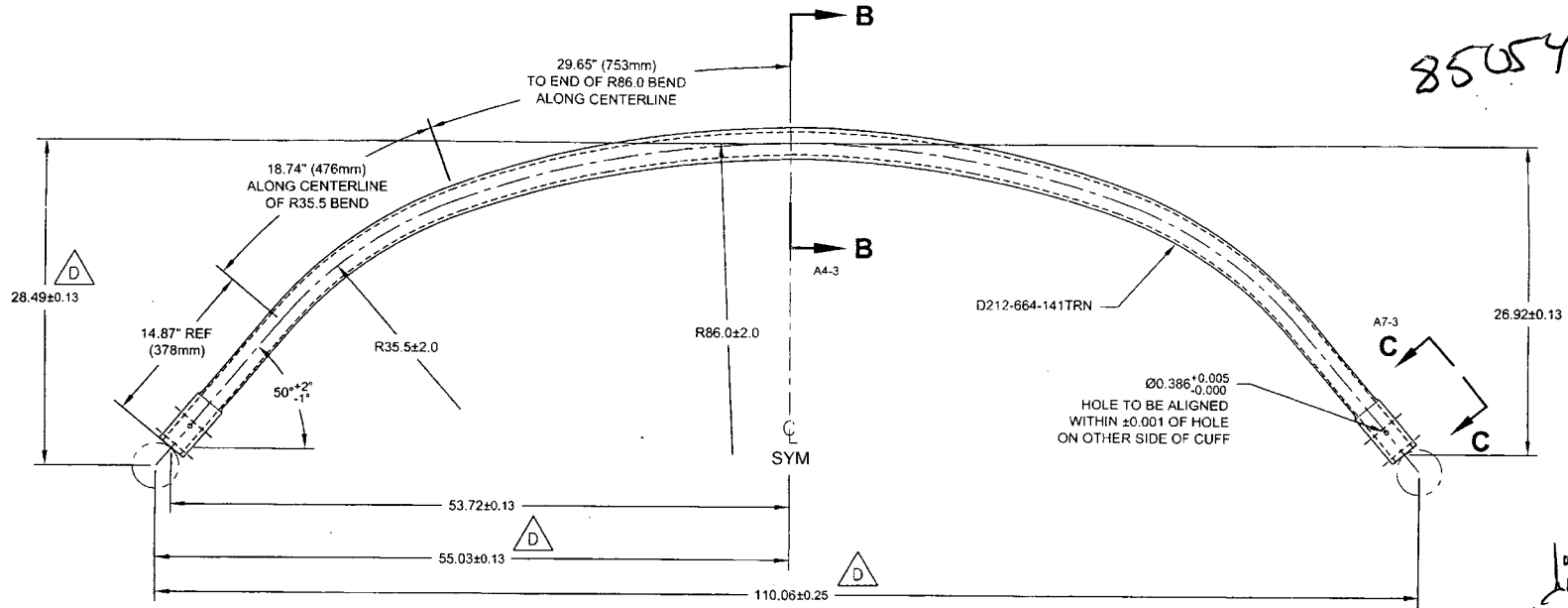
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

8 7 6 5 4 3 2 1



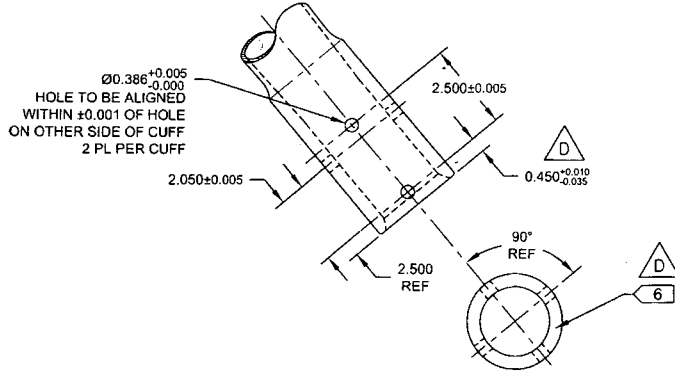
D212-664-501
BENDING AND DRILLING DETAIL

10 D

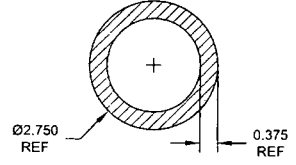
UNDER REVIEW
11.09.03

DEO ATTACHED

RELEASED
2009-10-29



VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	92	DRAWING NO.	REV. D
MFG. APPR.	10	D212-664-141	SHEET 3 OF 4
APPROVED	10	TITLE	SCALE
DE APPR.	10	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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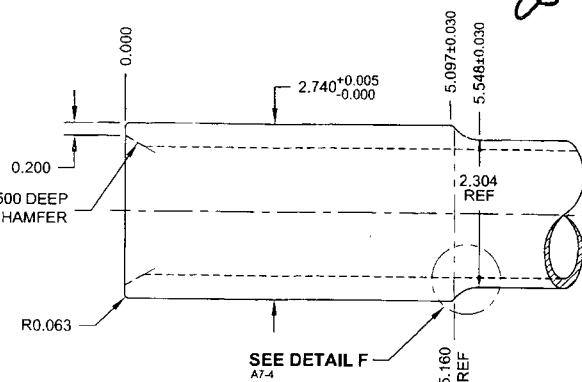
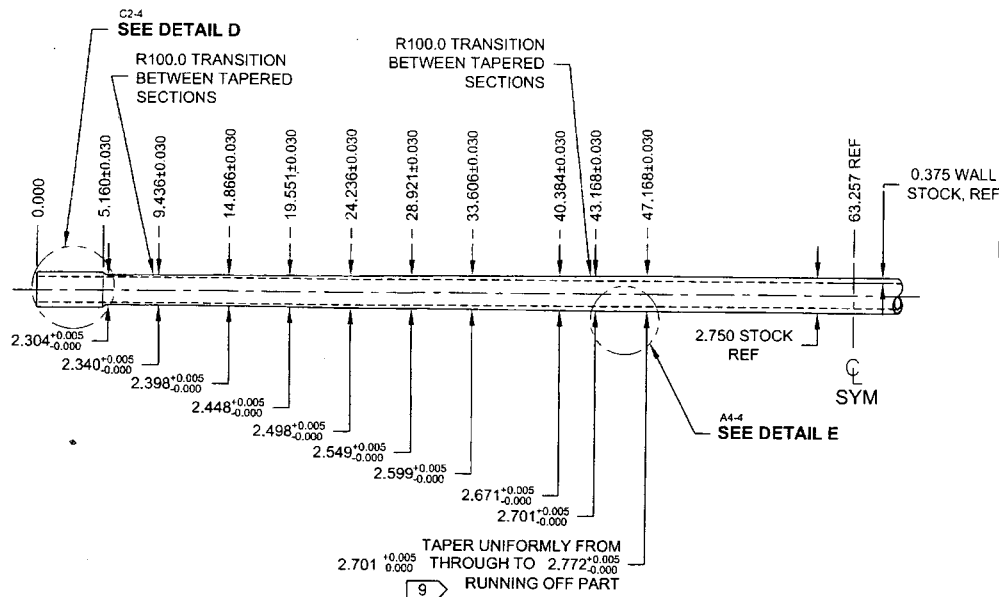
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

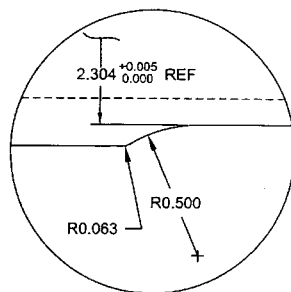
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

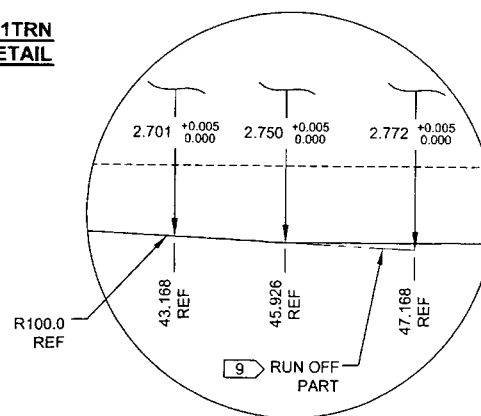


DETAIL D:
CROSSTUBE CUFF D8-4
SCALE 5X



DETAIL F:
CUFF TRANSITION C2-4
SCALE 10X

D212-664-141TRN
TURNING DETAIL



DETAIL E:
TAPER RUN-OFF C5-4
NOT TO SCALE

UNDER REVIEW
CP 11.06.13

DEO ATTACHED

RELEASED
2009-10-29
AW

DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	18	D212-664-141	SHEET 4 OF 4
APPROVED	14	TITLE	SCALE
DE APPR.	14	XTUBE ASS'Y (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.07.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

25054

RELEASED
2011-04-18

UNDER REVIEW

11/06/13
D212-664
11.07.28

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D212-664-141	TITLE XTUBE ASSY (205/212/412 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>CP</i>	MFG. APPR. <i>E</i>	APPROVED <i>WAD</i>	DE APPR. <i>WAD</i>			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

IS:

WAS:

UNDER REVIEW

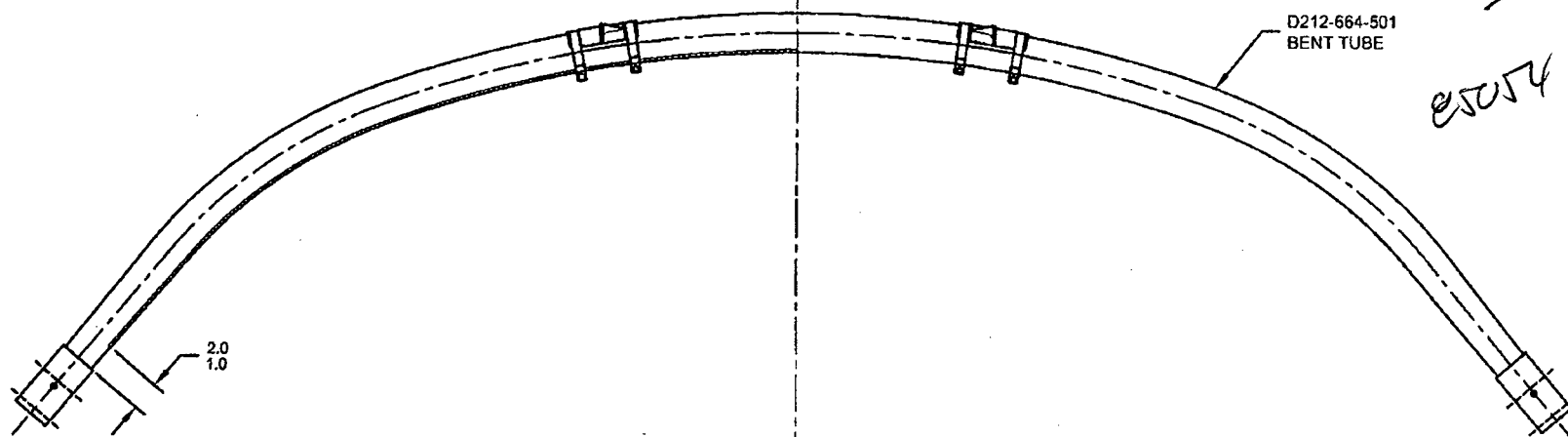
CP 11/06/13

ECV# 11-614

11.07.28

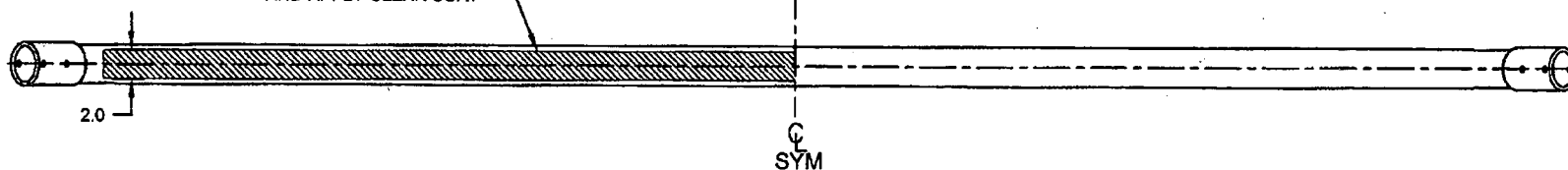
D212-664-501
BENT TUBE

ESU74



**D212-664-141/-141B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



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WRITTEN PERMISSION FROM DART AEROSPACE LTD.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D212-664-141	TITLE CROSSTUBE ASS'Y (205 HI FWD)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>AB</i>	APPROVED <i>MD</i>		DE APPR. <i>CH</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/07/21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -141	Qty -141B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2893-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
MD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

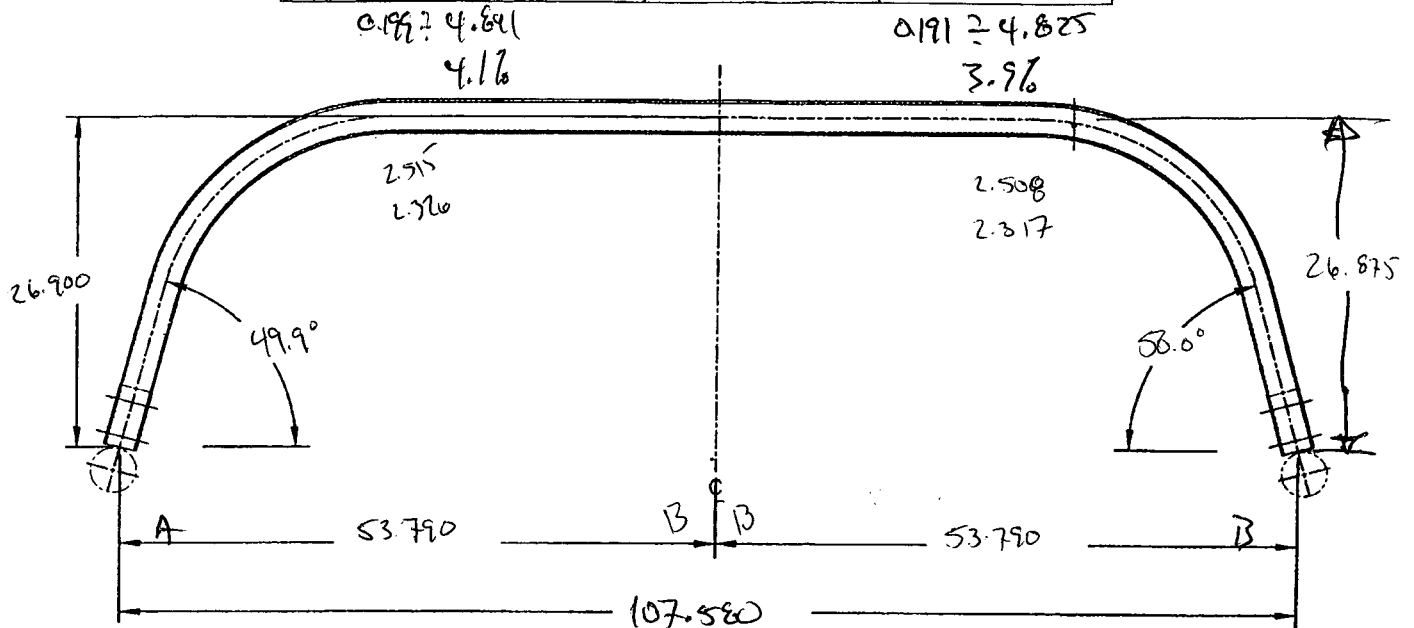
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	85054
Description: Crosstube High Fwd (205/212/412)		Part Number:	D212-664-101
Inspection Dwg: D212-664-141		Rev: D	Page 1 of 1

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments	
Side A = 4.1% crushing	@ B passes
Side B = 3.9% crushing	@ B passes

QC15 Inspection	S
Date	12/06/08

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	
C	10.04.01	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



LIQUID PENETRANT TEST REPORT

P- 12134

CLIENT
ATTENTION
ADDRESS
PROJECT
ITEM(S) EXAMINED

DAIT Aerospace
LINDA LAGELLE
1270 ABERDEEN ST.
Hawkesbury, ON

DATE

06/12/12

PAGE

OF

1

TIME

AM

PM

ACUREN JOB NO.

188-12-20260

PO/WO NO.

WORK LOCATION

SAME

ACCEPTANCE STD

ASTM 1417/05F038

REV./DATE

2005F.P.I. on cross tubes

DESCRIPTION

PROCEDURE NO. LT002 REV./DATE 2008TECHNIQUE NO. LT002 REV./DATE 2008

MATERIAL

SEE RESULTSAluminum

THICKNESS

various

SCOPE

WET FLUORESCENT LIQUID PENETRANT INSPECTION WITH
COMPLETED 100% EXTERNAL AREA.

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIER
FAMILY BRAND	<u>MAGNA FLUX</u>		BLACK LIGHT S/N	<u>16459</u>	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²
PENETRANT	<u>2L67</u>	MINIMUM DWELL TIME	<u>45</u>	MIN.	<input type="checkbox"/> AMBIENT < 25°C
PENETRANT REMOVER	<u>H20</u>	MINIMUM DRY TIME	<u>>10</u>	MIN.	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
DEVELOPER	<u>SDS2</u>	MINIMUM DWELL TIME	<u>10</u>	MIN.	OTHER <u>LABINO</u>
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY	LIGHT METER S/N	<u>1098366</u>
					CAL DUE DATE <u>July 29/12</u>

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/20°F	<input type="checkbox"/> -4°C/20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS-

☒ METRIC ☐ IMPERIAL

CROSS TUBES -
4 - W.O. # 83083 ✓
4 - # 83082 ✓
4 - # 85055 ✓
4 - # 85054 ✓

8/12/12

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as well as any other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

Acuren Group Inc. provides services provided. Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, express or implied, is made or extended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE

Andy Sheldon

PRINT

Sheldon

SIGNATURE

DTR #

E63544

TECHN. SIGNATURE:

Mike J. Hest1ST TECHNICIAN2ND TECHNICIAN

NAME (PRINT):

CGSB LEVEL

SNT LEVEL

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

6606

CGSB REG. NO.

REPORT

REVIEWED BY:

NAME

INITIALS

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PT Sep. 2005



ACUREN

Daily Time Report

E-63544

Form dated 1/1/00

Client:

Contact:

Location:

Description:

Report #'s:

VMT AeroSpace
Linda
1270 ABEIDEEN ST. Hawkesbury
F.P.I. on CROSS TUBES
AS FOLLOWS

Job #:

30557

Day:

Sun

Mon

Tues

P.O. #:

Vehicle #

471

Date:

06/12/2012

Wed

Thurs

Fri

Sat

W.O. #:

188-12-0260

Camera #:

Name	Specialist	Tech.	CEDO	Assistant	Start Time	Total Hours			KM	LOA ONLY	OTM ONLY	Labour Agreement (if known) or type of work	TLD No.	Daily DRD Readings
						Travel	Worked	SP						
M. J. Hosh		✓			6:00	2	2		100	<input type="checkbox"/>	<input type="checkbox"/>			
					AM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					AM					<input type="checkbox"/>	<input type="checkbox"/>			
					AM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					AM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					AM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			
					PM					<input type="checkbox"/>	<input type="checkbox"/>			

WELD INSPECTION SUMMARY

Weld Diameter										Long Seam					Circ. Seam				
Schedule/Thickness										Thickness					Thickness				
Quantity										Lineal Ft.					Lineal Ft.				

Film:

Pcs. 2 3/4 x 17"

Pcs. 3 1/2 x 17"

Pcs. 4 1/2 x 17"

Pcs. 14" x 17"

Pcs. _____

Re-billable expenses:

Equipment charges:

Client Representative: *[Signature]*Consumables
(cans / litres):

UT

PT

MT

ACUREN 1-877-299-2857

Cambridge, ON (519) 622-3112 • Fax (519) 622-1326
 Cantley, QC (819) 360-0685 • Fax (819)-827-3513
 Cornwall, ON (613) 931-1261 • Fax (613) 931-2777
 Gaspé, QC (418) 392-3618 • Fax (418) 392-4114
 Halifax, NS (902) 443-4448 • Fax (902) 445-5090
 Jonquiere, QC (418) 542-8273 • Fax (418) 542-5494
 Mississauga, ON (905) 673-9899 • Fax (905) 673-8394
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 Pickering, ON (905) 839-0015 • Fax (905) 839-5641
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 St. John's, NL (709) 753-2100 • Fax (709) 753-7011
 Samia, ON (519) 336-3021 • Fax (519) 336-8220
 Shorbrooke, QC (819) 620-5456 • Fax (819) 346-6828
 Sudbury, ON (705) 522-1849 • Fax (705) 522-9926
 Thunder Bay, ON (807) 475-4240 • Fax (807) 577-2017
 Timmins, ON (705) 365-8313 • Fax (705) 267-2855
 Val D'Or, QC (819) 856-6789 • Fax (819) 825-6554

NOTES:

UNITS INSPECTED - CROSS TUBES
 W.O. #'S 83083, 83082
 85055, 85054



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Tel: 613 632 9577
Fax: 613 632 1053

Purchase Order ID PO17187

Purchase Order Date 6/12/2012

PO Print Date 6/12/2012

Page Number 1 of 1

Order From :

VC-ACU002

ACUREN
2190 SPEERS ROAD
OAKVILLE, ON L6L 2X8
CA

Contact Name
Vendor Phone 613 931 1261
Vendor Fax 613 931 2777
Vendor Account Nbr

Buyer Brigitte Golden
Requisition Nbr
Tax Resale Nbr 10127-2607
Terms Net 30
Currency CAD
FOB Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN
HAWKESBURY, ON K6A 1K7
CANADA

FAKED

Line Nbr	Reference Revision ID Vendor Part Number	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
1	85055 ✓	Crosstube D212-664-101	6/12/2012 No	1.00	Yours ppd ✓	\$146.7500	\$146.7
2	85054 ✓	Crosstube D212-664-101	6/12/2012 No	1.00	Yours ppd ✓	\$146.7500	\$146.7
3	83083 ✓	D212-664-101 Crosstube	6/12/2012 No	1.00	Yours ppd ✓	\$146.7500	\$146.7
4	83082 ✓	D212-664-101 Crosstube	6/12/2012 No	1.00	Yours ppd ✓	\$146.7500	\$146.7

PO Total: \$577.8

Change Nbr: 1

Change Date: 6/12/2012

No substitution or deviation without
consent.
Certificate of Conformity or Material
Certification required - YES NO